Journal of Microscopy

1978. Vol. 114 Contents and Indices

U.I.C.C.

OCT 1 1979

LIBRARY

Joint Editors: P. Echlin, B. Ralph H. J. G. Gundersen (Stereology)

EDITORIAL ADVISORY BOARD

D. G. Murchison

B. C. Cowen

P. C. Robinson

B. Afzelius

R. Barer

A. Boyde

V. E. Cosslett

G. Dupouy

Audrey M. Glauert

J. I. Goldstein

D. T. Grubb

G. H. Haggis

T. A. Hall

P. B. Hirsch

E. D. Hondros

A. Howie

D. C. Joy

J. V. P. Long

G. W. Lorimer

D. E. Newbury

G. Nomarski

T. F. Page

A. G. E. Pearse

H. Piller

I. S. Ploem

M. Pluta

A. W. Robards

F. W. D. Rost

A. J. Saubermann

G. Thomas

M. A. Williams

Representatives for the International Society for

Stereology

H. Häug

(I.S.S. President)

B. Eisenberg

H. E. Exner

H. P. Hougardy

R. E. Miles

W. L. Nicholson

G. Ondracek

E. R. Weibel



Published for the Royal Microscopical Society by Blackwell Scientific Publications Oxford London Edinburgh Melbourne

Journal of Microscopy

Patron: HER MAJESTY THE QUEEN

Officers and Council 1978-79

President: BRIAN RALPH

Vice-Presidents: D. G. MURCHISON A. W. ROBARDS

Hon. Secretary: P. C. ROBINSON

Hon. Treasurer: B. C. COWEN

Ordinary Members of Council:

D. ASHHURST
S. R. KEOWN
A. J. BAKER
B. D. LAKE
P. B. GAHAN
T. MULVEY
J. R. GARRETT
T. F. PAGE
W. G. HARTLEY
D. J. JOHNSON
J. S. PLOEM

Hon. Joint Editors:

P. ECHLIN B. RALPH

H. J. G. GUNDERSEN (Stereology)

Journal Executive Secretary: ANNE RALPH

Administrator: P. G. FLEMING

Contents of Vol. 114

Part 1

DAVID J. SMITH, N. W. JEPPS and T. F. PAGE. Observations of silicon carbide by high resolution transmission electron microscopy	1
A. T. Sumner. Quantitation in biological X-ray microanalysis, with particular reference to histochemistry	19
DONALD GREELEY, JAMES D. CRAPO and ROBIN T. VOLLMER. Estimation of the mean caliper diameter of cell nuclei. I. Serial section reconstruction method and endothelial nuclei from human lung	31
James D. Crapo and Donald A. Greeley. Estimation of the mean caliper diameter of cell nuclei. II. Various cell types in rat lung	41
Brent Mersey and M. E. McCully. Monitoring of the course of fixation of plant cells	49
H. HILLMAN and K. DEUTSCH. Area changes in slices of rat brain during preparation for histology or electron microscopy	77
A. T. Sumner and D. Finlayson. A film holder for use with the Vickers M85/M86 microdensitometer	85
CLAIRE LANGSTON and WILLIAM M. THURLBECK. The use of simple image analysers in lung morphometry	89
Short Technical Notes	
J. M. STURGESS, M. M. MITRANIC and M. A. MOSCARELLO. Extraction of glycoproteins during tissue preparation for electron microscopy	101
CHARLES A. STIRLING. A simple method for maintaining relative positions of separate tissue elements during processing for electron microscopy	107
PAOLO GORI. Ponceau 2R staining of proteins and periodic acid bleaching of osmicated subcellular structures on semi-thin sections of tissues processed for	111
electron microscopy: a simplified procedure	
Book Reviews	115

DAVID C. JOY and DENNIS M. MAHER. A practical electron spectrometer for chemical analysis	117
F. J. Guild and B. W. Silverman. The microstructure of glass fibre reinforced polyester resin composites	131
Angela Downs and M. A. Williams. An iterative approach to the analysis of EM autoradiographs. I. The method	143
M. A. WILLIAMS and ANGELA DOWNS. An iterative approach to the analysis of EM autoradiographs. II. Estimates of sample sizes and confidence limits	157
C. J. R. Sheppard and T. Wilson. The theory of scanning microscopes with Gaussian pupil functions	179
G. Khavari-Khorasani, H. E. Blayden and D. G. Murchison. Refractive index and absorption coefficient as measures of structural organization in carbonized bitumen	199
E. R. Buckle. Nature and origin of particles in condensation fume: a review	205
T. BISTRICKI and M. MUNAWAR. A rapid preparation method for scanning electron microscopy of Lugol preserved algae	215
JACK K. HARRIS. A photoelastic substrate technique for dynamic measurements of forces exerted by moving organisms	219
M. V. NERMUT, I. D. J. BURDETT and L. D. WILLIAMS. Negative staining of freeze-fractured envelopes of <i>Escherichia coli</i> K_{12}	229
D. S. Reid. A programmed controlled temperature microscope stage	241

J. R. Casley-Smith and Pamela Davy. The estimation of distances between parallel membranes on thick sections	249
DONALD A. Greeley and James D. Crapo. Practical approach to the estimation of the overall mean caliper diameter of a population of spheres and its application to data where small profiles are missed	261
J. OVERDIJK, H. B. M. UYLINGS, K. KUYPERS and A. W. KAMSTRA. An economical, semi-automatic system for measuring cellular tree structures in three dimensions, with special emphasis on Golgi-impregnated neurons	271
W. A. Aherne and P. J. Diggle. The estimation of neuronal population density by a robust distance method	285
M. O. Warman. The rôle of optical microscopy in refractories development within the iron and steel industry	295
Peter B. Canham and Kerry Mullin. Orientation of medial smooth muscle in the wall of systemic muscular arteries	307
A. L. Larrabee, J. Babiarz, R. G. Laughlin and A. D. Geddes. Sizing of phosphatidylcholine vesicles by transmission electron microscopy	319
PETER SCHMIALEK, BURGER ZAPF, FRIEDHELM BAISCH, ASTRID GEYER, VERENA MIOSGA and MICHAEL NÜNDEL. An automatic counter for autoradiographed cells in Petri dishes	329
Walter Pfaller and Erwin Rovan. Preparation of resin embedded unicellular organisms without the use of fixatives and dehydration media	339
Short Technical Note	
L. G. BRIARTY and R. L. RAMSEY. A simple time-lapse unit	353
Book Reviews	357

Index of subjects

Absorption coefficient as measure of structural organization of carbonized bitumen, 199

Algae, Lugol preserved, rapid preparation method for, 215

Arteries, systemic muscular, orientation of smooth muscle, 307

Autoradiographs, iterative approach to analysis of, 143, 157

Autoradiographed cells, automatic counter for, 329

Bitumen, carbonized, refractive index, 199

Caliper diameter of cell nuclei, 31, 41 Caliper diameter of a population of spheres, estimation of, 261

Cells, autoradiographed, automatic counter for, 329

Cells, plant, monitoring the course of fixation, 49

Cell nuclei, estimation of the caliper diameter of, 31, 41

Cellular tree structures, semi-automatic system for measuring, 271 Chemical analysis, electron spectrometer

for, 117 Condensation fume, nature and origin of particles, 205

Dynamic measurements, photoelastic substrate technique, 219

Electron microscopy,

Area analysis in slice of brain, 77 extraction of glycoproteins during tissue preparation, 101

method to maintain relative position of separate tissue elements, during processing, 101 Ponceau 2R staining of proteins, 111

Film holder, for Vickers microdensitometer, 85

Fixation, monitoring course of, 49

Freeze-fractured envelopes of Escherichia coli K₁₂, 229 Fume, condensation, nature and origin of

particles, 205

Gaussian pupil function, theory of scanning microscopes, 179

Glass-fibre reinforced polyester resin composites, micro structure of, 131

Glyco-proteins, extraction of, during tissue preparation, 101 Golgi-impregnated neurones, system to

measure cellular tree structures, 271

High resolution transmission electron microscopy, observations of silicon carbide, 1

Histochemistry, X-ray microanalysis, 19 Histology, area changes in slice of rat brain,

Image analysers, use of, in lung morphometry, 89

Lung,

human, serial section reconstruction method, 31 morphometry, use of image analysers in, rat, cell types in, 41

Membranes, parallel, estimation of distances between, 249 Microdensitometer, film holder for, 85 Microscope stage, programmed controlled temperature, 241 Muscle, medial smooth, orientation of, in

Neuronal population density, estimation of,

arteries, 307

Optical microscopy, role of in refractories development, 295 Organism, unicellular, resin-embedded, without fixative, 339

Periodic acid bleaching of osmicated structures, 111

Petri dishes, automatic counter for, 329 Photoelastic substrate technique for dynamic measurements, 219

Plant cells, monitoring course of fixation of, 49 Polyester resin composite, reinforced,

microstructure of, 131 Ponceau 2R staining of proteins, 111 Population density, neuronal estimation of,

Profiles, small, missed, in a population of spheres, 261

Refractive index in carbonized bitumen, 199

Resin composites, microstructure of, 131 Resin embedded unicellular organism, 339

Scanning electron microscopy, rapid preparative method, for algae, 215 Scanning microscopes, theory of, Gaussian pupil functions, 179 Serial section reconstruction, 31 Silicon carbide, observations of, 1 Spectrometer, practical electron, for chemical analysis, 117

Staining, Negative of freeze-fractured envelopes of E. coli K₁₂, 229

Time-lapse unit, simple, 353
Tissue elements, separate, method to
maintain position of, 107 Tissue preparation, extraction of glyco-proteins during, 101

Tissue sections, Ponceau 2R staining, 111

Transmission electron microscopy, high resolution observation of silicon carbide, l sizing of phosphatidylcholine vesicles, 319

Vesicles, photphalidylcholine, sizing of, by TEM, 319 Vickers M85/86 microdensitometer, film

holder for, 85

X-ray microanalysis, quantitation in, 19

Index of authors

Aherne, W.A., 285 Babiarz, J., 319 Baisch, F., 329 Bistricki, T., 215 Blayden, H.E., 199 Briarty, L.G., 353 Buckle, E.R., 205 Burdett, I.D.J., 229

Canham, P.B., 307 Casley-Smith, J.R., 249 Crapo, J.D., 31, 41, 261

Davy, P., 249 Deutsch, K., 77 Diggle, P.J., 285 Downs, A., 143, 157

Finlayson, D., 85

Geddes, A.D., 319 Geyer, A., 329 Gori, P., 111 Greeley, D.A., 31, 41, 261 Guild, F.J., 131

Harris, J.K., 219 Hillman, H., 77

Jepps, N.W., 1 Joy, D.C., 117

Kamstra, A.W., 271 Khavari-Khorasani, G., 199 Kuypers, K., 271

Langston, C., 89 Larrabee, A.L., 319 Laughlin, R.G., 319

Maher, D.M., 117 McCully, M.E., 49 Mersey, B., 49 Miosga, V., 329 Mitranic, M.M., 101 Moscarello, M.A., 101 Mullin, K., 307 Munawar, M., 215 Murchison, D.G., 199

Nermut, M.V., 229 Nündel, M., 329

Overdijk, J., 271

Page, T.F., 1 Pfaller, W., 339

Ramsey, R.L., 353 Reid, D.S., 241 Rovan, E., 339

Schmialek, P., 329 Sheppard, C.J.R., 179 Silverman, B.W., 131 Smith, D.J., 1 Stirling, C.A., 107 Sturgess, J.M., 101 Sumner, A.T., 19, 85

Thurlbeck, W.M., 89

Uylings, H.B.M., 271

Vollmer, R.T., 31

Warman, M.O., 295 Williams, L.D., 229 Williams, M.A., 143, 157 Wilson, T., 179

Zapf, B., 329